

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant: Amit S. Kelkar et al. PATENT APPLICATION
Serial No.: Group Art Unit:
Filed: Examiner:
For: METHOD OF FORMING PRE-METAL DIELECTRIC FILM
ON A SEMICONDUCTOR SUBSTRATE INCLUDING FIRST
LAYER OF UNDOPED OXIDE OF HIGH OZONE:TEOS
VOLUME RATIO AND SECOND LAYER OF LOW OZONE
DOPED BPSG

Information Disclosure Statement

Mail Stop Reissue
Commissioner for Patents
Alexandria, VA 22313-1450

Sir:

The following information is submitted in compliance with Applicants' duty of disclosure under 37 CFR § 1.56. A copy of each reference is enclosed.

| <u>U.S. Patents</u> | | |
|---------------------|-----------------|-------------------|
| <u>Pat. No.</u> | <u>Inventor</u> | <u>Grant Date</u> |
| 6,218,268 | Xia et al. | Apr. 17, 2001 |
| 6,091,121 | Oda | Jul. 18, 2000 |
| 6,090,675 | Lee et al. | Jul. 18, 2000 |
| 6,013,584 | M'Saad | Jan. 11, 2000 |
| 5,994,237 | Becker et al. | Nov. 30, 1999 |
| 5,869,403 | Becker et al. | Feb. 09, 1999 |
| 5,607,880 | Suzuki et al. | Mar. 04, 1997 |
| 5,518,962 | Murao | May 21, 1996 |
| 5,491,108 | Suzuki et al. | Feb. 13, 1996 |
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| 5,332,694 | Suzuki | Jul. 26, 1994 |
| 5,314,845 | Lee et al. | May 24, 1994 |

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| 5,271,972 | Kwok et al. | Dec. 21, 1993 |
| 5,166,101 | Lee et al. | Nov. 24, 1992 |

Foreign Patent Documents

| <u>Publication No.</u> | <u>Publication Date</u> | <u>Country</u> |
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| 0 435 161 A1 | July 3, 1991 | EPO |

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Wolf et al, Silicon Processing for the VLSI Era,
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CERTIFICATE OF EXPRESS MAILING

I hereby certify that this paper (along with any paper referred to as being attached or enclosed) is being deposited with the United States Postal Service on the date shown below with sufficient postage as Express Mail Label EV342173155US in an envelope addressed to: Mail Stop Reissue, Commissioner for Patents, Alexandria, VA 22313-1450.

Signed: Merle P. Garcia

Typed Name: Merle P. Garcia

Date: June 25, 2003

Respectfully submitted,



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|--|--|---------------|---------------|-------------------------------------|--------------|----------------------------|--|
| FORM PTO-1449 | | | | Atty. Docket No. ATM-247 | | Serial No. | |
| LIST OF PRIOR ART CITED BY APPLICANT | | | | Applicant: Amit S. Kelkar et al. | | | |
| | | | | Filing Date: | | Group: | |
| U.S. PATENT DOCUMENTS | | | | | | | |
| Examiner Initial* | Document Number | Grant Date | Name | Class | Sub Class | Filing Date | |
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| AK | 5,332,694 | 07/26/94 | Suzuki | 437 | 195 | | |
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| AN | Wolff et al., Silicon Processing for the VLSI Era, Vol. 1, Lattice Press, 1986, pp. 182-191. | | | | | | |
| AO | | | | | | | |
| AP | | | | | | | |
| EXAMINER: | | | | DATE CONSIDERED: | | | |
| *Examiner: Initial if citation considered, whether or not citation is in conformance with MPEP 609; draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant. | | | | | | | |

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| FORM PTO-1449 | | | Atty. Docket No. ATM-247 | | Serial No. | |
| LIST OF PRIOR ART CITED BY APPLICANT | | | Applicant: Amit S. Kelkar et al. | | | |
| | | | Filing Date: | | Group: | |
| U.S. PATENT DOCUMENTS | | | | | | |
| Examiner Initial* | Document Number | Grant Date | Name | Class | Sub Class | Filing Date |
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| OTHER ART (Including Author, Title, Date, Pertinent Pages, Etc.) | | | | | | |
| AM | | | | | | |
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| EXAMINER: | | | | DATE CONSIDERED: | | |
| *Examiner: Initial if citation considered, whether or not citation is in conformance with MPEP 609; draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant. | | | | | | |

INTERNATIONAL SEARCH REPORT

In tional Application No

PCT/US 99/08973

A. CLASSIFICATION OF SUBJECT MATTER
IPC 6 C23C16/40 C23C16/44

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 6 H01L C23C

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

| Category * | Citation of document, with indication, where appropriate, of the relevant passages | Relevant to claim No. |
|------------|--|-----------------------|
| X | EP 0 307 995 A (STICHTING KATHOLIEKE UNIV) 22 March 1989 (1989-03-22) | 1 |
| Y | figure 1 | 11 |
| Y | US 5 648 175 A (RUSSELL KATHLEEN ET AL) 15 July 1997 (1997-07-15) claims 1,6,12 | 11 |
| X | PATENT ABSTRACTS OF JAPAN vol. 018, no. 077 (E-1504), 8 February 1994 (1994-02-08) & JP 05 291144 A (RYODEN SEMICONDUCTOR SYST ENG KK;OTHERS: 01), 5 November 1993 (1993-11-05) abstract | 1 |
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☒ Further documents are listed in the continuation of box C.

☒ Patent family members are listed in annex.

* Special categories of cited documents:

"A" document defining the general state of the art which is not considered to be of particular relevance

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"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

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"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.

"Z" document member of the same patent family

Date of the actual completion of the international search

18 August 1999

Date of mailing of the international search report

26/08/1999

Name and mailing address of the ISA

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INTERNATIONAL SEARCH REPORT

In International Application No

PCT/US 99/08973

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| A | <p>WO 97 24755 A (LAM RES CORP ;IBM (US); SIEMENS AG (DE)) 10 July 1997 (1997-07-10) the whole document -----</p> | 5,6,9,10 |

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In International Application No

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| Patent document cited in search report | | Publication date | Patent family member(s) | | Publication date |
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European
Patent Office

EUROPEAN SEARCH REPORT

Application Number

EP 90 12 4837

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| Category | Citation of document with indication, where appropriate, of relevant passages | Relevant to claim | CLASSIFICATION OF THE APPLICATION (Int. Cl.5) |
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| A | EP-A-0 212 691 (FOCUS SEMICONDUCTOR SYSTEMS) * columns 13 - 16; figures 1, 2 * - - - - | 1,2 | |
| A | INTERNATIONAL ELECTRON DEVICES MEETING TECHNICAL DIGEST 03 December 1989, WASHINGTON D.C. pages 669 - 672; H. KOTANI et al.: "Low-temperature APCVD oxide using TEOS-ozone chemistry for multilevel interconnections" * page 669, right-hand column - page 670, left-hand column; figures 3, 4 * - - - - | 1 | |
| A | US-A-3 647 663 (JAMES A. CUNNINGHAM ET AL.) * column 2, lines 35 - 59; claims 1, 3 * - - - - - | 1 | |
| | | | TECHNICAL FIELDS SEARCHED (Int. Cl.5) |
| | | | H 01 L C 23 C |
| The present search report has been drawn up for all claims | | | |
| Place of search Berlin | | Date of completion of search 13 March 91 | Examiner KLOPFENSTEIN P R |
| CATEGORY OF CITED DOCUMENTS X: particularly relevant if taken alone Y: particularly relevant if combined with another document of the same category A: technological background : non-written disclosure P: intermediate document T: theory or principle underlying the invention E: earlier patent document, but published on, or after the filing date D: document cited in the application L: document cited for other reasons ----- &: member of the same patent family, corresponding document | | | |